Soda Creek/North Butte Allotment

Botany Report for
Special Interest Plant Species

Almanor Ranger District
Lassen National Forest

Prepared by: Don Lepley Date: 9/10/2009

Don Lepley
Assistant Forest Botanist

Reviewed by: Allison L. Sanger Date: 9/10/2009

Allison L. Sanger
Forest Botanist

I. INTRODUCTION

The National Forest Management Act (NFMA) requires the Forest Service to "provide for a diversity of plant and animal communities" [16 U.S.C. 1604(g)(3)(B)] as part of our multiple use mandate. Watch-list plants (known as Special Interest plant species on the Lassen NF) are species that do not meet all the criteria to be included on the Regional Forester's Sensitive List but are of sufficient concern that they should be considered in the planning process (Weingardt 2006). These species make an important contribution to forest biodiversity and should be maintained under the provisions of NFMA and addressed as appropriate through the NEPA process (Sprague 1998).

II. PROPOSED PROJECT

A. Project Area

The SC/NBA project area encompasses 28,837 acres of Plumas and Butte Counties southwest of Chester, California. About 95% of the acreage (27,267 acres) is National Forest System (NFS) land. The Soda Creek Allotment includes the upper watersheds of Yellow, Grizzly, and Soda Creeks, along with their associated tributaries. The North Butte Allotment includes the upper watershed of Butte Creek and its tributaries. The landscapes of both allotments are characterized by moderate to steep slopes at elevations between about 4600 and 7100 feet. The slopes are clothed in westside mixed conifer or red fir forest, with interspersed, sometimes extensive patches of montane chaparral and small dry to wet meadows, fens, and riparian corridors.

B. Alternative 1: The Proposed Action

The Forest Service proposes to continue authorized grazing in the SC/NBA under an adaptive management system in order to progress toward meeting desired conditions as described in the Lassen National Forest Land and Resource Management Plan, Record of Decision (1993), and as modified through the Sierra Nevada Forest Plan Amendment, Record of Decision (2004). This strategy, including Integrated Design Features for botany and other resources, would be outlined in a revised Allotment Management Plan (AMP), which would be incorporated in the current 10-year Term Grazing Permit, Part 3, Terms and Conditions. In addition to the adaptive management strategy, the AMP includes allotment-specific resource objectives, management requirements, rangeland improvement criteria, and details regarding monitoring and evaluation.

The Term Grazing Permit would be an on/off variable grazing permit whereby numbers, type of livestock (cow-calf, yearlings, dry cows), and dates and times may be adjusted when authorized by a Forest Officer within a permitted limit. Yearlong rest can be scheduled without being considered personal nonuse. Total authorized use for the "on" portion would be 27 cow-calf pairs (50%) or 109 Animal Unit Months (AUMs), with a season of use varying between June 1 and September 15. Use for the "off" portion would be the same, for a total of 218 AUMs. The capable NFS primary range acreage, when adjusted for other-than-suitable acres, is estimated to be 1,555 acres under the proposed action. An already-planned cedar-rail

exclosure to protect *Botrychium* habitat along North Fork Willow Creek is due for installation in 2009-2010, and additional fencing is planned at Milkhouse Flat, Horseshoe Fen, and L-T Creek.

For additional information on proposed livestock management in the project area, consult the SC/NBA Environmental Assessment, hereby incorporated by reference.

C. Alternative 2: No Action (No Grazing)

Under the No Action alternative, livestock grazing would be discontinued within the SC/NBA. Structures related to grazing, such as water troughs and fences, would be removed if and when feasible. This alternative, if selected, would include a Forest Plan amendment to close the allotment and remove it from the grazing program. Other ongoing management activities in the project area would continue.

D. Alternative 3: Current/Historic Management (2001 permit)

Under this alternative, authorized livestock grazing will continue in the SC/NBA as described in the 2001 term permit. Grazing will be authorized with 27 cow-calf pairs on NFS lands and 27 cow-calf pairs off, for a total of 54 pairs within a season of use generally fixed from June 16 to September 15 (with some variability depending on range readiness). Actual use must stay within 90 percent of permitted use unless non-use is authorized. Total authorized use would be approximately 218 AUMs. Management under this alternative would be similar to the Proposed Action except that the Integrated Design Features for botany would not be included in the permit.

E. Integrated Design Features (IDFs) for Botanical Resources

The following are the botanical protection measures for the SC/NBA project. IDFs for other resources can be found within the SC/NBA project EA, as herein incorporated by reference.

1) Threatened, Endangered, and Sensitive (TES) and Special Interest Plant Species

a) Known occurrences of *Botrychium* spp., *Meesia triquetra*, *Meesia uliginosa*, and *Silene occidentalis* ssp. *longistipitata* will be monitored for impacts by livestock. Any new TES or Special Interest occurrences discovered after project implementation will be monitored for impacts from livestock. Sites having fens, TES plants, or Special Interest species are to be managed as critical areas emphasizing livestock management which restricts cattle grazing or ground disturbance. If monitoring indicates impacts to known or new TES or Special Interest occurrences from livestock activities, then adjustments, including potential fencing, will be made to alleviate the impacts.

b) Salt blocks and staging or gathering areas will be placed outside of known TES and Special Interest occurrences.

2) Noxious Weeds

a) Known noxious weed infestations will be identified and mapped for the allotment. Identified noxious weed sites within or adjacent to the allotment containing isolated patches with small plant numbers will be evaluated and treated according to the species present and project constraints.

b) Salt blocks and staging or gathering areas will be placed outside of known weed sites.
c) Only certified weed-free hay, straw and/or mulch, and feed pellets, rolled grains, or certified weed-free cubes are authorized to be used on the Forest, as per current national policy (FSM 2080.03(3)). Under the same policy, seed mixes used for revegetation of disturbed sites will consist of locally adapted native plant materials to the extent practicable.
d) If monitoring indicates a need for change in management strategies to eradicate noxious weeds, the plan (AMP) will be modified.

3) Fens and other Special Aquatic Features

Botanical inventories have identified several fens within the Allotment. Surveys of these sites have been initiated to detect impacts and evaluate whether they are within Proper Functioning Condition. Existing survey data suggests that the allotment has been adequately surveyed and no further intensive survey will be required in areas of primary range. The following management strategy will be applied to continue protection of these sites:

1. Implementation Monitoring – The fens will be monitored using the PFC checklist (IDT participation) (USDA FS 2009b) every 3-5 years. Implement Standard Protection Measures (SPMs) if
   - a fen trends toward Functioning at Risk or Non-functional, or
   - in any two consecutive years it shows greater than 10 percent soil disturbance.

2. Standard Protection Measures – Those actions which prevent ongoing or future damage to fens resulting from range activities, including:
   - fencing, exclosure, or debris barrier to keep cattle from the impacted fens and associated meadow systems,
   - directing cattle away from sensitive plant sites, while permittee is riding the allotment,
   - relocation of cattle management facilities and key areas outside of fens,
   - evaluating areas for alternative water sources,
   - closure of the area(s) containing fens from the allotment, and
   - reduction of cattle numbers and/or season of use.

Additional measures may be developed to restore and/or protect impacted fens from continued damage.

III. EXISTING CONDITIONS

There are currently nine species of Special Interest plants found within the Soda Creek/North Butte Allotment. The following briefly summarizes the survey, habitat, and distribution information for Special Interest Plant species known to occur in project area:

Botrychium simplex (little grapefern)

Botrychium simplex grows in meadows near streams in red fir and lodgepole pine communities at elevations ranging from 5,000 to 10,500 ft (Calflora 2009). There is no California Native Plant Society

ranking for this species (CNPS 2009). *Botrychium simplex* has been observed at 46 locations within 18 counties in California (Calflora 2009) and is considered to be one of the most widely distributed of the moonwort species (USDA Forest Service 2009). There are nine known occurrences on the Lassen National Forest: eight are located within the Almanor Ranger District and one at Magee Lake within the Thousand Lakes Wilderness on the Hat Creek Ranger District (USDA Forest Service 2009).

Within the SC/NBA there are two known occurrences of *Botrychium simplex*, one at LT Creek (LNF #1) and one at Milkhouse Flat (LNF #3); the LT occurrences was not relocated at its last monitoring visit in 2004, and at Milkhouse Flat one plant was seen in 2001 and none in 2009. Monitoring visits to both occurrences have noted heavy grazing in the past (USDA Forest Service 2009)

Carex limosa (shore sedge)

Carex limosa is a rhizomatous sedge with distinctively drooping lower spikelets (Hickman 1993). It grows on floating "bog"-mats, soggy meadows, marshes, swamps, and wet edges of lakes in lower to upper montane coniferous forests at elevations ranging from 3,900 to 9,200 ft (CNPS 2009). The California Native Plant Society ranks this species as List 2.2, and considers it a species that is rare, threatened, or endangered in California, but more common elsewhere, and fairly threatened in California (2009). This species is known to occur in Butte, El Dorado, Fresno, Lassen, Nevada, Plumas, Siskiyou, and Tuolumne counties in California, and elsewhere (CNPS 2009). There are 34 known occurrences in California, with six found on the Lassen National Forest all within known fens on the Almanor Ranger District (CNDDB 2009, USDA Forest Service 2009).

Within the SC/NBA there is currently only one known occurrence of *Carex limosa*, found at Green Island Lake and neighboring Frog Lake (USDA Forest Service 2009)—this area is currently closed to grazing within the SC/NBA project boundary.

Claytonia palustris (marsh claytonia)

Claytonia palustris is a perennial herb of the purslane family that grows in marshes, wet meadows, and seep areas at 3,200 to 8,200 feet (CNPS 2001). It flowers from June to August and generally must be in flower to identify. The California Native Plant Society ranks it as a List 4.3 species (limited distribution and not very endangered in California) (2009). *Claytonia palustris* is endemic to California, where it occurs in Butte, Fresno, Plumas, Siskiyou, Tehama, and Tulare counties (CNPS 2001). On the Lassen National Forest it is known from 28 occurrences on the Almanor Ranger District in the vicinity of Jonesville, Butt Creek, and Mineral (USDA Forest Service 2009).

Two occurrences are known from the SC/NBA, near Butte Creek just upstream from its confluence with Willow Creek (LNF #7) and along Scotts John Creek a little above its confluence with Butte Creek (LNF #10). Both sites are found within areas that have the potential to receive direct and in direct impacts from grazing activities; however, no impacts by cattle were noted when these occurrences were found (USDA Forest Service 2009)

Drosera anglica (English sundew)

Drosera anglica is a small insectivorous perennial found in wet meadows, bogs and fens from 4,290 to 6,600 ft (CNPS 2009). The leaves are in a basal rosette, and are elongate/spatulate with sticky gland-

tipped hairs (Hickman 1993). The California Native Plant Society ranks this species as List 2.3, which is a species that is rare, threatened, or endangered in California, but more common elsewhere, and not very threatened in California (2009). This species is known to occur in Lassen, Nevada, Plumas, Shasta, and Siskiyou counties in California, and Idaho, Oregon, Washington, and elsewhere (CNPS 2009). There are 20 documented occurrences of this species in California; nine of which are located on the Lassen National Forest, all within the Almanor Ranger District (CNDDB 2009; US Forest Service 2009).

Within the SC/NBA there are two known occurrences of *Drosera anglica*, one at Green Island Lake (LNF #8) and another north of Soda Spring adjacent to Soda Creek (LNF #9). Both of these occurrences are within Soda Creek Canyon, in an area that is currently closed to livestock grazing.

Eriophorum gracile (slender cottongrass)

Eriophorum gracile is a rhizomatous plant in the sedge family (Hickman 1993). It grows on acidic soils in bogs, fens, meadows, and seeps, in upper montane coniferous forests from 4,200 to 9,600 ft (CNDDB 2009). The California Native Plant Society ranks the species as List 4.3, considering it to have a limited distribution and to be not very threatened in California (2009). This species is known to occur in Butte, El Dorado, Lassen, Madera, Mariposa, Nevada, Plumas, Shasta, Sierra, Sonoma, and Tuolumne counties in California, and elsewhere (CNPS 2009). There are approximately 30 known occurrences in California (CNPS 2006), with two confirmed occurrences on the Lassen National Forest, both within SC/NBA (USDA Forest Service 2009). One occurrence has been found within Savanna Fen at the headwaters of Grizzly Creek (LNF #1), and another was recently found along Soda Creek at Split-level Fen (LNF #2). Recent monitoring at Savanna Fen noted that cattle punches were found mostly within the drier, non-fen areas of the system, not where the *Eriophorum* was observed, and Split-level Fen is found within a portion of the SC/NBA that is currently closed to grazing.

Penstemon heterodoxus var. *shastensis* (Shasta beard-tongue)

Penstemon heterodoxus var. *shastensis* is a perennial herb in the figwort family with dark, opposite leaves, and tubular purple flowers (Hickman 1993). It grows on gravelly volcanic substrates and sandy granitic soils in meadows and seeps and chaparral in lower to upper montane coniferous forests, from 3,600 to 7,900 ft (CNDDB 2009). The California Native Plant Society ranks this species as List 4.3, considering the species to have a limited distribution but to be not very threatened in California (2009). This California endemic species is known to occur in Butte, Lassen, Modoc, Plumas, Shasta, and Siskiyou counties in California (CNPS 2009). Currently, there are 21 known occurrences of this species on the Lassen National Forest (USDA Forest Service 2009).

Within the SC/NBA Allotment there are currently two known occurrences of *Penstemon heterodoxus* var. *shastensis*, one along Sawmill Tom Creek and forest road 26N31 (LNF #6) and another within the Butte Creek Ecological Reserve (LNF #3). No grazing impacts have been noted at either site (USDA Forest Service 2009).

Polystichum lonchitis (Northern hollyfern)

Polystichum lonchitis is a rhizomatous herb in the woodfern family with linear, pinnately compound leaves (Hickman 1993). It grows in moist, shady crevices in granite or carbonate cliffs in upper montane and subalpine coniferous forests from 5,900 to 8,600 ft elevations (CNDDB 2009). The California Native Plant Society ranks this species as List 3, plants for which more information is needed before assigning a rarity code (2009). It is known from Alpine, El Dorado, Glenn, Plumas, Shasta, and Siskiyou counties in California, and elsewhere (CNPS 2009). There is currently only one known population on the Lassen National Forest near Green Island Lake (USDA Forest Service 2009), an area that is currently closed to grazing within the SC/NBA project boundary.

Potamogeton robbinsii (Robbin's pondweed)

Potamogeton robbinsii is a rhizomatous, aquatic herb in the pondweed family (Hickman 1993). It grows in the deep water of lakes, marshes, and swamps at elevations ranging from 5,000 to 11,550 ft (CNDDB 2009). The California Native Plant Society ranks this species as List 2.3, and considers it rare, threatened, or endangered in California, but more common elsewhere, and not very threatened in California (CNPS 2009). It is known from Alpine, Fresno, Inyo, Lassen, Madera, Mono, Nevada, Sierra, Siskiyou, and Tuolumne counties in California, and elsewhere (CNPS 2009). This species is known to the Lassen National Forest at Saucer Lake on the Almanor Ranger District, within the Green Island Lake RNA (USDA Forest Service 2009), which is closed to grazing within the project area.

Sparganium nutans (small-bur-reed)

Sparganium nutans is a submersed aquatic species in the cattail family. It can be distinguished by its burlike fruit and a leaflike bract that is shorter than the accompanying inflorescence (Hickman 1993). It grows along the margins of lakes and ponds at elevations ranging from 6,600 to 8,250 ft (CNDDB 2009). The California Native Plant Society ranks this species as List 4.3, and considers it to have a limited distribution, but not very threatened in California (2009). This species is known to occur in El Dorado, Lassen, Madera, Placer, Plumas, Shasta, and Tuolumne counties in California, and elsewhere (CNPS 2009). There are five known occurrences on the Lassen National Forest; found on all three Ranger Districts (USDA Forest Service 2009).

Within the SC/NBA there is currently only one known occurrence of *Sparganium nutans* found within Green Island Lake (USDA Forest Service 2009), an area that is currently closed to grazing within the SC/NBA project boundary.

Stellaria obtusa (obtuse starwort)

Stellaria obtusa is a slender, prostrate perennial herb in the pink family with opposite, ovate leaves that are ciliate at the base and more or less evenly spaced (Hickman 1993). It grows along streams and the edges of seeps in riparian woodland in lower and upper montane coniferous forests from 900 to 7,800 ft (CNDDB 2009). The California Native Plant Society ranks this species as List 4.3, considering it to have a limited distribution and to be not very threatened in California (2009). This species is known to occur in Butte, Glen, Humboldt, Lassen, Nevada, Plumas, Shasta, Sierra, Tehama, and Tuolumne counties in California, and elsewhere (CNPS 2009). There are 73 occurrences of this species on the Lassen National

Forest: two are located on the Hat Creek Ranger District, and 71 are within the Almanor Ranger District (USDA Forest Service 2009).

Within the SC/NBA there are currently 24 known occurrences of *Stellaria obtusa* found throughout the project area (Table 1). Of the 24 occurrences, three are found in areas closed to grazing (#7, #56, and #67). Of the remaining 21 occurrences, only five have recorded impacts from cattle (#25, #33, #38, #39, and #53) (USDA Forest Service 2009).

Table 1: Known locations of *Stellaria obtusa* and grazing impact status.

Location	Occurrence #	Grazing Impacts observed in area	Grazed
Upper Butte Creek	1	None noted	Yes
Sawmill Tom Creek	5	None noted	Yes
LT Creek	6	None noted	Yes
Tributary to Soda Creek, Green Island Lk RNA	7	None noted	No
Southeast of Summit Lake	13	None noted	Yes
Willow Creek Humbug	14	None noted	Yes
Scotts John Creek south	24	None noted	Yes
Milkhouse Flat	25	Trampling in spring	Yes
Willow Creek N of Butte Creek House	28	None noted	Yes
Scotts John Creek north	31	None noted	Yes
Big Springs at head of LT Creek	33	Yes	Yes
Junction of Slate and Rock Creeks	35	None noted	Yes
Willow Creek	37	None noted	Yes
East of PCT between Roads 27N11 and 26N02	38	Yes	Yes
N. Fork Willow Creek, near Humbug Summit	39	Sites heavily grazed	Yes
North of Rd. 26N27, near Scotts John Creek	43	None noted	Yes
1 mile SSE of Butte Creek House	53	Heavy livestock impacts	Yes
1.5 miles north of Butte Creek House	55	No cattle disturbance	Yes
S end of Green Island Lake RNA	56	None noted	No
E of Milkhouse Flat	60	None noted	Yes
SW of Cirby Meadow	62	None noted	Yes
Soda Spring Fen	67	None noted	No
Willow Creek	70	None noted	Yes
SW of Cold Spring	72	None noted	Yes

IV. EFFECTS OF THE PROPOSED PROJECT

Among the 10 Special Interest species that occur in the SC/NBA project area, five of them are known only within the Green Island Lake Research Natural Area and/or downstream in the canyon of Soda Creek. The species are *Carex limosa, Drosera anglica, Polystichum lonchitis, Potamogeton robbinsii,* and *Sparganium natans.* Since these plants occur in areas that are closed to grazing and difficult to reach in any case, they will not be affected by livestock management in the SC/NBA project area, and there will be no direct, indirect, or cumulative effects on them arising connected with the project. One of the two *Eriophorum gracile* occurrences, the one in Soda Creek canyon, is similarly protected and will not be affected by the project. Neither will there be effects for the occurrence of *Penstemon shastensis* var. *heterodoxus* (#3) that was described in the occurrence report as being inside the southeast corner of the Butte Creek House Ecological Preserve, administered by the California Department of Fish and Game.

The species that will be analyzed for direct, indirect, and cumulative effects include, *Botrychium simplex, Claytonia palustris, Eriophorum gracile* (at Savanna Fen only), *Penstemon heterodoxus* var. *shastensis* (at Sawmill Tom Creek only), and *Stellaria obtusa.*

A. Alternative 1: The Proposed Action

1. Direct Effects

Direct effects are those actions which can physically damage plants or the habitats in which they grow, including trampling, removal, and grazing by livestock and burial by animal waste. If individual plants are thus damaged or lost, they are unable to contribute to seed production within the population.

Direct effects to most occurrences of *Claytonia palustris* and *Stellaria obtusa* are possible with the implementation of the Proposed Action. Among the occurrences in question, perhaps the ones least likely to see direct effects from livestock activity are the two occurrences of *Claytonia palustris* (#7 and #10) and the *Stellaria obtusa* #70 along Willow Creek. These three occurrences are all in the area where Scotts John and Willow Creeks run into Butte Creek, downstream from Butte Creek House. The area is west of the typical grazing allotment rotation (see Section II:2 of the Allotment Management Plan), and little impacts from cattle has been noted in past occurrence reports from the area, except for some "mucking" in the seep at *Claytonia palustris* #7 in 1992. Streambanks in the area tend to be somewhat steep and rocky and probably discourage livestock travel. Much the same can be said for *Stellaria obtusa* #24 and #31 along Scotts John Creek, even though the terrain is gentler. Cattle pass through this drainage each year but reportedly prefer other watersheds that have more forage—little evidence of cattle usage has ever been noted in this area. In addition, there will be beneficial effects to the *Stellaria obtusa* occurrence (#39) at the North Fork of Willow Creek, since this occurrence will be fenced from livestock impacts as part of a range improvement proposed for the adjacent *Botrychium minganense* occurrence.

Direct effects to *Claytonia palustris*, whether by trampling, removal, or burial, are likely to be no more than incidental, and the species has 26 more occurrences scattered across the Almanor Ranger District, including several nearby to the west, around Jonesville, and to the south, toward Philbrook Reservoir. *Stellaria obtusa* has many more occurrences in the SC/NBA project area than the three mentioned above, and

livestock impacts have been noted at five of them in the past (see Table 1 above). Being an inconspicuous, ground-hugging species, it is unlikely to be grazed, but it is vulnerable to trampling and burial. On the positive side, where it occurs, it often spreads in more or less extensive colonies with dozens, hundreds, or even thousands of plants, sometimes mixed with the similar *Stellaria crispa*. The colony at occurrence #53, for example, was reported as being about nine square feet. With such a sprawling, ground-hugging habit, it is likely that plants at any individual occurrence can sustain impacts from the small numbers of cows that travel through the SC/NBA project area. *Stellaria obtusa* is probably the most "common" rare plant on the Almanor Ranger District: with 73 occurrences on the Forest and 24 within the project area (three of which are protected from livestock activity), impacts at most sites are unlikely to be more than incidental and unlikely to affect the viability of the species across the District or its range.

In addition, there should only be incidental direct effect to *Eriophorum gracile* at Savanna Fen, from the implementation of the Proposed Action. The site is part of a meadow system along the east side of the head of Grizzly Creek. The system includes a dry meadow to the north and a tiered wet meadow to the south, with a fall line between the upper shelf and the lower shelf, which includes the fen. The *Eriophorum* plants are patchily distributed through the lower shelf, mostly in the northwest corner of the fen portion. At the time of initial report in 2007, cattle activity was evident in the dry meadow and along the fall line; however, cows seemed to be avoiding the wettest areas altogether, and no damage was noted to *Eriophorum* plants, which numbered well over 100. With water and shade available in the creek corridor to the west, there seems to be no reason to expect this pattern of usage to change. Even though cows could easily reach the *Eriophorum*, the plants were flourishing in 2007 and will likely experience no more than occasional incidental direct effects from grazing, trampling, or waste burial in the future.

The occurrence of *Penstemon heterodoxus* var. *shastensis* at Sawmill Tom Creek may be more vulnerable to direct grazing impacts, since it is growing just below Forest Road 26N31 in open, herb-dominated riparian habitat. This location is within the general rotation area described in Section II:2 of the Allotment Management Plan and is typically visited late in the annual rotation, by which time the plants would have completed their annual cycle of growth and reproduction. The rotation pattern is not fixed, however, and direct grazing impacts could possibly occur earlier in the season while the plants are still active; nonetheless, 60 plants were present at the time of the occurrence report, and no cattle impacts were noted.

The fortunes of *Botrychium simplex* within the SC/NBA project area are difficult to predict, due to lack of information. The occurrence at LT Creek was originally reported in 1992 with a rather generalized site description and has not been relocated since. The site was apparently within the fenced area below the junction of LT and Panhandle Creeks. The meadows here are a complicated mosaic of willow strands, brooks, moist lodgepole stands, wet meadows, and fens. Given the complicated habitat and the diminutive nature of *Botrychium* plants, it is hardly surprising that the plants have not been relocated. The habitat was originally described as "wet meadow bank near creek," which suggests the site was open and susceptible to livestock activity. At LT, such activity is concentrated at the end of the grazing season, by which time *Botrychium* plants would likely have distributed reproductive spores for the year. This would help perpetuate the occurrence in the event that particular plants are buried by animal waste or any of the aboveground parts eaten (the plants are often very small). The more serious and likely direct effect would be trampling and, in

wet habitat where a hoof could go deep into the soil, damage to the plants' overwintering parts underground. Several dozen plants were reported at the site, so, given the size of the area (17 acres) and the limited time that cattle are present (one to two weeks), direct effects may be no more than incidental. There will be beneficial effects to the occurrence at Milkhouse Flat, since it will be fenced from livestock as part of range improvements proposed as part of the Proposed Action.

2. Indirect Effects

Indirect effects primarily relate to changes in a species' habitat, such as changes in local hydrology or vegetation structure, as well as increased risk of noxious weed invasion.

There should be only limited indirect effects to Special Interest Plant species from the implementation of the Proposed Action. As noted above, the sites for *Claytonia palustris* and *Stellaria obtusa* along Scotts John and Willow Creeks and along Butte Creek below Butte Creek House have shown at most limited cattle usage in years past. No changes in hydrology or vegetation structure due to livestock activity are likely here. Among the other occurrences of *Stellaria obtusa*, livestock damage has been noted at five sites (see Table 1 above). At four of these, plants were seen at least partly under alders or willows. That is typical of the species: it generally prefers to be somewhat shaded, cool, and wet. Even when there is livestock activity at these five sites, it is unlikely to be heavy enough to remove the alders and willows under which *Stellaria* prospers, and thereby, to change the microclimate of its habitat. On the whole, it seems unlikely that indirect effects will ever be substantial enough to imperil *Claytonia palustris* or *Stellaria obtusa* in the SC/NBA project area or across their range, due to their frequency within the project area, the low cattle usage of some sites where the plants occur, and to natural protection from association with alders and willows at some sites.

Protracted, concentrated livestock activity is capable of disrupting fen hydrology and vegetation structure permanently. As noted above, however, such impacts have not been observed at Savanna Fen, where *Eriophorum gracile* occurs. Cattle are not entering the fen portion of the meadow system, which looks very healthy and intact. Therefore, no indirect effects to the *Eriophorum* are expected from livestock activity under the SC/NBA project. Should future monitoring show impacts from livestock activity, the Adaptive Management Strategy for Fens and Other Special Aquatic Features (see page 4 above) calls for measures to be taken to eliminate the impacts.

Habitat for *Penstemon heterodoxus* var. *shastensis* at Sawmill Tom Creek is already open, and it is relatively dry for a riparian strip. Here too, livestock activity will not alter the existing habitat in such a way as to indirectly affect the species.

Even though direct effects to *Botrychium simplex* are possible at the meadows along LT Creek, alteration of environmental context due to livestock activity is unlikely. Though moderate to heavy grazing and trampling were reported in 2001 and 2004 (in both cases late in the season, the time when cattle are gathered there for a brief period shortly before being removed from the allotment for the year), the wetland system is large, diverse, and resilient—during a tour of the wetlands in July of 2009, the system looked very healthy and vigorous. As a result, long-term changes to hydrology and vegetation structure due to livestock activity are unlikely. Project IDFs provide for ongoing monitoring and, as necessary, consequent adjustments to

livestock activities to protect the occurrence if future impacts are determined to be detrimental to the viability of this species at LT Creek.

3. Cumulative Effects

A cumulative effect can result from the incremental impact of the action when added to the effects of past, present, and reasonably foreseeable future actions. Past activities are implicitly considered by reviewing existing conditions, since these reflect the residual impacts of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects. By looking at conditions now, we capture the effects of such actions and events collectively, regardless of the contributions of particular actions or events. The project area was chosen as the cumulative effects analysis area for *Botrychium simplex, Claytonia palustris, Eriophorum gracile, Penstemon heterodoxus* var. *shastensis,* and *Stellaria obtusa* because their historic ranges and specific habitat requirements are unknown, and it was assumed that if the SC/NBA project would not affect the viability of these species within the project area, it would not affect their viability outside of the project area. Past, ongoing, or future vegetation treatments on private lands may have had cumulative impacts to the species under consideration here, but since survey requirements and mitigations for their occurrences are not known, the nature and extent of impacts to the species cannot be quantified.

Past Actions

Past activities known to have occurred within the SC/NBA project area include timber harvest and other vegetation management actions, Christmas tree permits, road maintenance activities, and various recreational activities, such as hiking and camping, OHV use, and hunting. Past actions, being implicit within existing conditions, are addressed through the occurrence summaries given above.

Ongoing Actions

Ongoing vegetation management, special use, and recreation projects on the District have been surveyed to similar standards as the SC/NBA Project. For such projects, known occurrences of Special Interest plant species for which viability was a concern have either been avoided by project activities or protected by IDFs that minimize impacts to the occurrences. Timber or firewood removal is unlikely to contribute more than incidental effects to the species under consideration here: *Claytonia palustris* and *Eriophorum gracile* occur in wet, open habitats without closely associated timber. *Botrychium simplex* and *Stellaria obtusa* may occur in somewhat more wooded, shaded conditions—tree removal at these sites could conceivably introduce desiccating sunlight, but the plants are usually associated with willows and/or alders that will maintain their growth conditions. *Penstemon heterodoxus* var. *shastensis* is oriented to meadow or meadow-edge conditions and may actually benefit from nearby tree removal.

For all the species under consideration, recreation will have at most incidental effects. Recreation within the SC/NBA project area is highly dispersed except along the Pacific Crest Trail and connector trails and scattered campgrounds, which do not contact any of the sites for Special Interest plants. Other than the trails, there are no summer homes, paved toads, or other infrastructure in the project area to attract concentrated

human traffic. Road maintenance probably contributes no effects to the species under consideration here, since none of the occurrences contact roadways.

Foreseeable Future Actions

Foreseeable future actions include vegetation management treatments under the following projects: Creeks II Forest Restoration Project; Lotts Aspen, Oak, & Pine Enhancement Project; Rust Resistant Sugar Pine Maintenance Project; and Scotts John Forest Health Recovery Project. These and other future actions within the project area would be adequately surveyed for Special Interest plant species. Any species for which viability was a concern would either be avoided by project activities or impacts mitigated through IDFs. The implementation of the Forest-wide Motorized Travel Management Plan will close the Forest to cross-country travel and will eliminate the use of some unauthorized routes within the project area, which will, if anything, enhance the integrity of the habitats where TES plants occur. Cumulative effects from noxious weed introduction and/or spread related to other projects are possible; however, given the low incidence of weeds across the area and the generally low vulnerability of its habitats to weed invasion, with the implementation of IDFs, weed issues in the project area are unlikely to intensify.

In sum, there are few if any effects to *Botrychium simplex, Claytonia palustris, Eriophorum gracile, Penstemon heterodoxus* var. *shastensis,* or *Stellaria obtusa* from any known past, present, or reasonably foreseeable future actions in the SC/NBA project area that would likely add cumulatively to project-related direct and indirect effects. Though few occurrences of *Botrychium simplex* and *Eriophorum gracile* are yet recorded on the Lassen National Forest, both species have global distributions (Hickman 1993). *Eriophorum gracile* is a recent addition to the Special Interest list on the Forest, and it is very likely that more occurrences will be recorded. *Botrychium simplex* is the second most common species of *Botrychium* in California: the species has been collected throughout the Sierra Nevada, as well as in the Warner, San Bernardino, and other California mountains (Consortium of California Herbaria 2009), and there are six other occurrences on the Lassen National Forest. Should either *Botrychium simplex* or *Eriophorum gracile* suffer impacts in the SC/NBA project area, it would not likely affect their viability across the Forest or their overall range. That is also true for *Claytonia palustris*, which is restricted to northern California but is rather frequent across the Almanor Ranger District, and very much true for *Stellaria obtusa*, which is widely distributed across the West, from California to British Columbia to Montana to Colorado (Hickman 1993), and has numerous occurrences across the Almanor Ranger District. The viability of *Penstemon heterodoxus* var. *shastensis*, a northern California endemic with 20 known occurrences scattered across the three districts of the Lassen National Forest, is also unlikely to be affected by any deleterious impacts at its Sawmill Tom site. Even in the event that plants at occurrences of any of these species suffered impacts, there would be no effect on the viability of the species in the SC/NBA project area or across their range.

B. Alternative 2: No Action

1. Direct and Indirect Effects

There would be no direct or indirect effects to *Botrychium simplex, Claytonia palustris, Eriophorum gracile*, *Penstemon heterodoxus* var. *shastensis* or *Stellaria obtusa* from Alternative 2 because no action would occur other than ongoing non-grazing activities. Besides the removal of the possibility of trampling or other

impacts by cattle, there would be additional beneficial effects from Alternative 2 associated with habitat recovery in those wet meadows, fens, and riparian areas that have seen impacts from livestock usage, particularly those where *Botrychium simplex, Claytonia palustris, Eriophorum gracile*, *Penstemon heterodoxus* var. *shastensis,* and *Stellaria obtusa* occur.

2. Cumulative Effects

Given that no negative direct or indirect effects are expected to *Botrychium simplex, ,Claytonia palustris, Drosera anglica, Eriophorum gracile*, *Penstemon heterodoxus* var. *shastensis* or *Stellaria obtusa* from the implementation of the No Action Alternative, cumulative effects are not a concern for these species.

C. Alternative 3: Historic Management (2001 permit)

The major difference between this Alternative and the Proposed Action is that IDFs would not be included in the permit and there would be no new fencing at Horseshoe Fen, LT Fen, Milkhouse Flat, or North Fork Willow Creek to protect Special Interest Plant species from ongoing impacts of livestock grazing. Furthermore, more primary range would be considered capable and suitable (2,402 acres versus 1,532 under Alternative 1).

1. Direct and Indirect Effects

Direct and indirect effects for individuals of *Botrychium simplex, Claytonia palustris, Eriophorum gracile* (at Savanna Fen only), *Penstemon heterodoxus* var. *shastensis* (at Sawmill Tom Creek only), and *Stellaria obtusa* are possible in the SC/NBA project area and would be similar to those described for Alternative 1. Without IDFs, however, means would not be available to protect plants of these species from the negative effects of livestock usage, should such effects be found during future monitoring or should new populations be discovered. Furthermore, without new fencing at Horseshoe Fen, LT Fen, Milkhouse Flat, and North Fork Willow Creek, rare plants there would be vulnerable to more of the same kinds of impacts that have already been observed. The is especially true for the occurrence of *Botrychium simplex* at Milkhouse Flat, which like that at LT Creek, is uncertain; however, unlike LT Creek, which currently has a perimeter fence, under Alternative 3 Milkhouse Flat would not be fenced. Numbers of *Botrychium simplex* were not reported for the original discovery in 1996, however, only one plant was seen in 2001, and no plants were located during recent monitoring in 2009. Plants may well still exist at Milkhouse Flat: since they persist by means of overwintering underground parts, their appearance aboveground can be variable and unpredictable from year to year, and they can easily escape discovery due to their small size. Under Alternative 3, any plants persisting at Milkhouse would be vulnerable to further impacts, including potential extirpation, from continued livestock activity within this meadow.

2. Cumulative Effects

For Alternative 3, the cumulative effects of past, ongoing, and foreseeable future actions would be identical to those discussed for Alternative 1. However, there will be more direct and indirect affects to *Botrychium simplex, Claytonia palustris* and *Stellaria obtusa* that would add cumulatively to any ongoing and future

action with the implementation of Alternative 3. Continued trampling and browsing are both possible for *Claytonia palustris, Eriophorum gracile*, *Penstemon heterodoxus* var. *shastensis,* and *Stellaria obtusa occurrences* within the project area, but over the period that these plants have been monitored, observed livestock impacts have mostly been minor to none. Considerable habitat impacts have been reported at a few of the *Stellaria obtusa* occurrences, but the species is sufficiently frequent on the Lassen National Forest that its viability is likely secure. Some degree of effect from continues livestock grazing is possible for all five species but unlikely to affect the viability of these species within the SC/NBA project area or across their range. The exception might be *Botrychium simplex*: its viability across its range would likely be unaffected by the project, but its status within the project area is uncertain with the implementation of Alternative 3.

V. REFERENCES

Calflora. 2009. Calfora Database. http://www.calflora.org/ [accessed August 2009]

California Native Plant Society (CNPS). 2001. *Inventory of Rare and Endangered Plants of California* (sixth edition). Rare Plant Scientific advisory Committee, David P. Tibor, Convening Editor. California Native Plant Society, Sacramento, CA.

California Native Plant Society (CNPS). 2009. Electronic CNPS Inventory of Rare and Endangered Plants of California (7th Edition). California Native Plant Society, Sacramento, CA. California Native Plant Society, Sacramento, CA. http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi. [accessed August 2009]

California Natural Diversity, RAREFIND, Data Base (CNDDB). 2009. California Department of Fish and Game. Version 3.1.0. February 1, 2009.

Consortium of California Herbaria. 2009. http://ucjeps.berkeley.edu/consortium/ [accessed August 2009]

Hickman, J.C (ed.). 1993. *The Jepson Manual: Higher Plants of California*. Univ. of California Press, Berkeley.

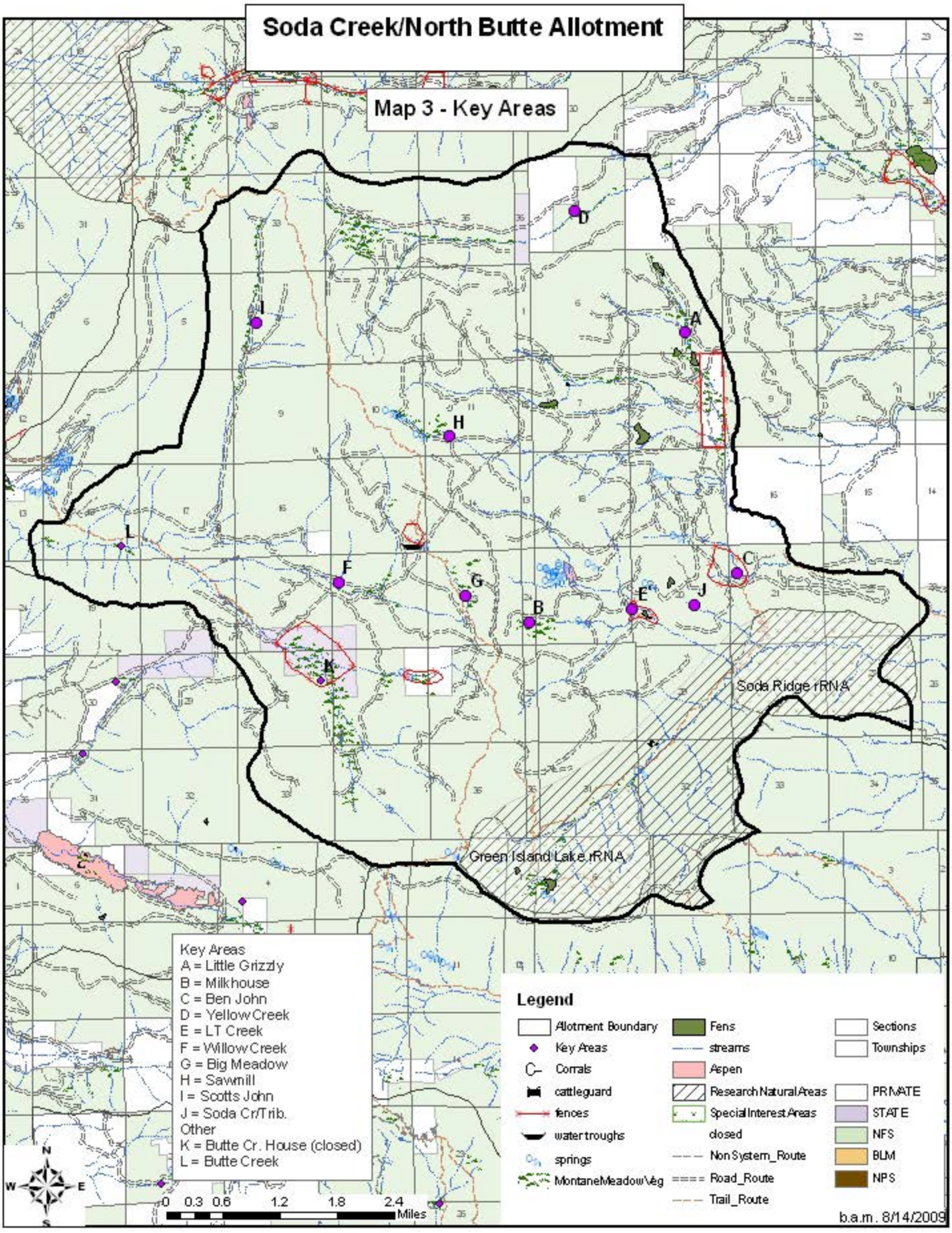
Sprague, L. 1998. Internal Forest Service Memo to Region 5, Forest Supervisors, on Sensitive Species List 1998. USDA Forest service, Pacific Southwest Region 5.

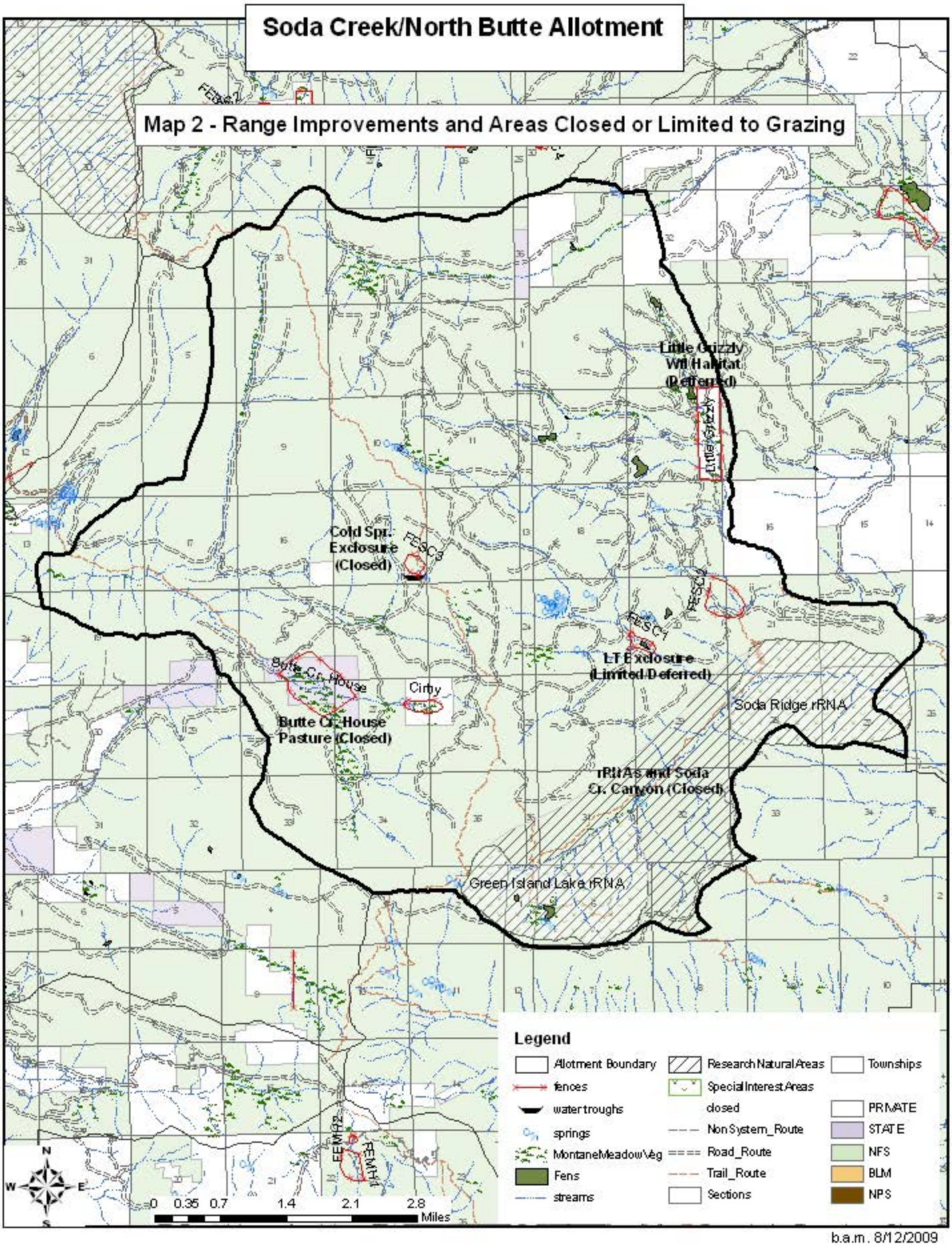
USDA Forest Service. 1993. (LRMP) Lassen National Forest Land and Resource Management Plan Record of Decision (1993) and Final Environmental Impact Statement (1992). Lassen National Forest, Pacific Southwest Region, USDA Forest Service.

USDA Forest Service. 2004. (SNFPA) Sierra Nevada Forest Plan Amendment, Final Supplemental Environmental Impact Statement and Record of Decision. Pacific Southwest Region, Forest Service, Vallejo, CA. Online at http://www.fs.fed.us/r5/snfpa/final-seis/index.html

USDA Forest Service. 2009. Lassen National Forest rare plant occurrence forms, Forest Atlases, GIS databases (including NRIS TESP Geodatabase), and Species and Project files.

Weingardt, B. 2006. Internal Forest Service Memo to Region 5, Forest Supervisors, on 2006 Sensitive Species List. USDA Forest Service, Pacific Southwest Region 5, Vallejo, CA.


Soda Creek/North Butte Allotment
Map 3 - Key Areas
A
B
C
D
E
F
G
H
I
J
K
L
Soda Ridge rRNA
Green Island Lake rRNA
Key Areas
A = Little Grizzly
B = Milkhouse
C = Ben John
D = Yellow Creek
E = LT Creek
F = Willow Creek
G = Big Meadow
H = Sawmill
I = Scotts John
J = Soda Cr/Trib.
Other
K = Butte Cr. House (closed)
L = Butte Creek
N
W
E
S
0 0.3 0.6 1.2 1.8 2.4
Miles
Legend
Allotment Boundary
Key Areas
Corrals
cattleguard
fences
water troughs
springs
MontaneMeadow\Veg
Fens
streams
Aspen
Research Natural Areas
Special Interest Areas
closed
Non System_Route
Road_Route
Trail_Route
Sections
Townships
PRIVATE
STATE
NFS
BLM
NPS
b.a.m. 8/14/2009


Soda Creek/North Butte Allotment
Map 2 - Range Improvements and Areas Closed or Limited to Grazing
Little Grizzly Wtl Habitat (Deferred)
Little Grizzly
Cold Spr. Exclosure (Closed)
FESC3
FESC2
FESC1
LT Exclosure (Limited/Deferred)
Butte Cr. House
Cirby
Butte Cr. House Pasture (Closed)
Soda Ridge rRNA
rRtAs and Soda Cr. Canyon (Closed)
Green Island Lake rRNA
FEMH2
FEMH1
Legend
Allotment Boundary
fences
water troughs
springs
MontaneMeadow\Veg
Fens
streams
Research Natural Areas
Special Interest Areas
closed
Non System_Route
Road_Route
Trail_Route
Sections
Townships
PRIVATE
STATE
NFS
BLM
NPS
N
W
E
S
0 0.35 0.7 1.4 2.1 2.8
Miles

b.a.m. 8/12/2009